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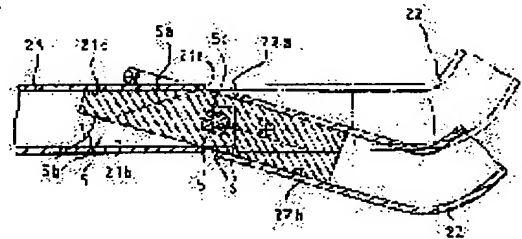
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(54) CHAIR PROVIDED WITH ELASTIC MOVABLE MEANS FOR BACK REST

(57)Abstract:

PROBLEM TO BE SOLVED: To apply easy feelings to a user, to improve durability in use in simple structure and to reduce production cost by inserting a fixed turn limiting element into the dividing end of seat plate frame and back rest frame, inserting and fixing both the ends of torsion bar spring into the insertion fixing holes of fixed turn limiting element.

SOLUTION: A seat plate frame 21 and a back rest frame 22 are divided at a fixed spot and at this dividing spot, an elastic movable means is installed. A fixed turn limiting element 5 is inserted into mutually adjacent cut end parts 21a and 22a of seat plate frame 21 and back rest frame 22. The fixed turn limiting element 5 has a slope 5a obliquely forming one part of upper surface, abutting plane 5b in contact with inside bases 21b and 22b of seat plate frame 21 and back rest frame 22 on the lower surface, and inserting hole 5c at the intermediate part. The fixed turn limiting element 5 is linked by a torsion bar spring 6. When pressure more than a fixed level is received, the torsion bar spring 6 is torsionally deformed at a fixed angle and when pressure is removed, its original state is recovered.



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CLAIMS

[Claim(s)]

[Claim 1] In the chair which a foot frame and a body frame divided into the back board frame which adhered to the back-plate frame and back board with which the back plate was fixed are consisted of, and said back board frame moves in a fixed angle flexibly The chair characterized by having the elastic movable means which consists of a rotation limit fixed piece by which both ends are inserted in the cutting circles by which said back-plate frame and the back board frame were divided, respectively, and a torsion bar spring which connected this rotation limit fixed piece and was fixed in the support pipe.

[Claim 2] The upper part of the front section of said rotation limit fixed piece is a chair according to claim 1 characterized by said back board frame rotating by tilt-angle within the limits of the inclined plane of a rotation limit fixed piece by forming an inclined plane so that a fixed piece can rotate at the time of rotation of said back board frame.

[Claim 3] The chair according to claim 1 characterized by carrying out connection installation of the elastic restoration on-the-strength adjustment means at said torsion bar spring.

[Claim 4] Said elastic restoration on-the-strength accommodation means is a chair according to claim 3 characterized by consisting of a piece of rotation by which an end is fixed to a torsion bar spring, a stretching screw screwed in the other end of said piece of rotation, and a horizontal tie rod which crosses said piece of rotation and is located on said stretching screw.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] It is related with a chair equipped with an elastic [for the back boards which give elastic stability to said back board frame so that a back board frame may return to the original location, if the force more than fixed is added in more detail about the chair which the frame whose this invention is a hollow-like steel bar is bent, and is manufactured and curvature and the force will be removed for a back board frame by the fixed include angle] movable means.

[0002]

[Description of the Prior Art] Since the structure is simple and manufacture is easy, the chair manufactured by bending the rectangular head of the hollow that in the location in which many people gather like a banquet hall generally used, or the steel bar of a circular cross section, constituting a back plate and a back board frame, and adhering a back plate and a back board on said frame is used widely. [many] However, the fixed chair of such structure was not able to provide about [having the function in which the structure top waist of a chair can be hung], and a taking-a-seat person with the comfortable feeling which can take an easy rest. Since a frame has hollow-like structure and it will be damaged very easily if a complicated operation system is installed while the deformation on structure is very difficult, since the reason is very simple for the structure of a chair, although a common chair needs to give a comfortable feeling, it is used as it is to current.

[0003]

[Problem(s) to be Solved by the Invention] Therefore, it is offering a chair equipped with the elastic means for back boards which attained elastic movement to which the technical problem of this invention is for solving such a trouble, and it is restored whether a back board frame's curving in this way as well as curving back and giving a user a comfortable feeling's if the back board frame of a chair receives the force's more than fixed according to very easy structure, carried out improvement of the use durable period of a chair in large, and made the manufacturing cost cheap.

[0004]

[Means for Solving the Problem] In the chair which consisted of body frames to which it is fixed to the foot frame which constitutes four support saddles, and said foot frame, said technical problem of this invention has a hollow cross section, and a back plate and a back board are fixed Said body frame is divided into a back-plate frame and a back board frame. To the division edge circles of said back-plate frame and back board frame The rotation limit fixed piece by which the inclined plane was formed in the 1 side upper part, the insertion fixed hole was formed in pars intermedia, and the contact side adjacent to the inside base of a frame was formed in the inferior surface of tongue is inserted. It is attained by the chair which equips the insertion fixed hole of the rotation limit fixed piece of said both sides with an elastic movable means to come to carry out insertion immobilization of the both ends of the torsion bar spring fixed with the support pipe.

[0005]

[Embodiment of the Invention] An accompanying drawing is consulted and the chair hereafter equipped with the elastic movable means for back boards by this invention is explained to a detail according to subsequent examples.

[0006] As shown in drawing 1 and drawing 2, the fixed chair (A) by this invention consists of a foot frame 1 which constitutes four support saddles, and a body frame 2 to which it is fixed on said foot

frame 1, and a back plate 3 and the back also hang down and 4 is fixed. Said foot frame 1 is hollow-like, and is bent and manufactured with the steel bar which has a rectangular head or a circular cross section. Said body frame 2 consists of a back-plate frame 21 to which a back plate 3 is fixed, and a back board frame 22 to which a back board 4 is fixed, both this frame is divided at a fixed point, and the elastic movable means for back boards (B) is installed in this division point.

[0007] In this example, the division part into which said body frame 2 is divided is cut by the back end of the part by which a back plate 3 is arranged. It is desirable to installation of the elastic movable means (B) which is not outside exposed and what is cut in the part which adjoined the back end of said back plate 3 mentions later.

[0008] Into amputation stump section 21a of the hollow cross section as for which said back-plate frame 21 and back board frame 22 carried out mutual contiguity, and 22a, the rotation limit fixed piece 5 which is the important section of the elastic movable means for back boards (B) is inserted. Said elastic movable means (B) contains the rotation limit fixed piece 5 and the torsion bar spring 6.

[0009] Inclined plane 5a formed aslant [on top / a part of] at a fixed include angle (theta) is formed, contact side 5b in contact with the inside bases 21b and 22b of said back-plate frame 21 and back board frame 22 is formed in an inferior surface of tongue, and, as for said rotation limit fixed piece 5, insertion hole 5c is formed in pars intermedia.

[0010] The tilt angle (theta) of said inclined plane 5a determines the tilt angle of the back board frame 22. If this tilt angle is large, the tilt angle of a back board frame will become large, and if a tilt angle is small, the tilt angle of a back board frame will become small.

[0011] Contact side 5b of said rotation limit fixed piece 5 touches the inside bases 21b and 22b of each frames 21 and 22, when the back board frame 22 is in the normal position. Insertion immobilization of said rotation limit fixed piece 5 is carried out at the amputation stump section of a back-plate frame and a back board frame, respectively. In this example, although the rotation limit fixed piece 5 was fabricated with the casting, it can be fabricated also with ingredients, such as aluminum or synthetic resin. Said rotation limit fixed piece 5 by which insertion immobilization was carried out is linked by two places of the body frame 2 with the torsion bar spring 6.

[0012] Said torsion bar spring 6 will twist and deform into a fixed include angle, if the force more than fixed is received, but when the force is removed, it has the stability restored to the original condition. Although said torsion bar spring 6 was formed so that it might have a square cross section in this example, it can also have the cross-section gestalt of other configurations.

[0013] Said torsion bar spring 6 is inserted into the support pipe 7, and fixed support is carried out. When it is fixed on the back-plate frame 21 in this example and the torsion bar spring 6 receives torsion, said support pipe 7 carries out support immobilization of the torsion bar spring 6 at a fixed point, and gives stability to the torsion bar spring 6. As shown in drawing 2, interstitial segment 7a of the support pipe 7 of this example is squarely formed like the cross-section configuration of the torsion bar spring 6, and prevents rotation of the torsion bar spring 6. The support back up plate 8 is welded to the both ends of said support pipe 7.

[0014] As drawing 3 thru/or drawing 6 show the chair by the 2nd example of this invention and shows it to drawing 3 thru/or drawing 5 The rotation limit fixed piece 5 by which the elastic movable means for back boards (B) is inserted into amputation stump section 21a and 22a, It consists of torsion bar springs 6 which are inserted in insertion hole 5c of said rotation limit fixed piece 5, and are combined with said rotation limit fixed piece 5, and the elastic restoration on-the-strength adjustment means (C) is being fixed to the pars intermedia of said torsion bar spring 6. An end is fixed to the torsion bar spring 6, and said elastic restoration on-the-strength adjustment means (C) crosses said foot frame 1 with the piece 70 of rotation by which the stretching screw 8 was combined with the other end extended ahead, and consists of horizontal tie rods 9 located on said stretching screw 8. The slot 71 in which said horizontal tie rod 9 is held is formed in the other end with which the stretching screw 8 of said piece 70 of rotation was combined, and it is made for the piece 70 of rotation to be located horizontally.

[0015] As shown in drawing 5, as for the rotation limit fixed piece 5 by the 2nd example of this invention, junction immobilization of the three division objects 55 of each other with which shearing of the metal plate was carried out to the configuration of a fixed piece is carried out by junction means, such as rivet 5b or welding. Since insertion hole 5c is formed of shearing and has proper

precision, the rotation limit fixed piece 5 of this invention is combinable without another processing with the torsion bar spring 6, its workability improves by this, and reduction of a manufacturing cost is possible for it. In this example, since sufficient reinforcement of the rotation limit fixed piece 5 was secured, each division object 55 used what was heat-treated.

[0016] As shown in drawing 4 and drawing 6, connection installation of the elastic restoration on-the-strength adjustment means (C) is carried out at an elastic movable means (B). the stretching screw 8 which insertion immobilization of the torsion bar spring 6 was carried out into fixed hole 70a formed in the end of the piece 70 of rotation, and the horizontal tie rod 9 touched the slot 71 of the other end of the piece 70 of rotation, and was combined with the piece 70 of rotation -- the upper and lower sides -- it is combined movable. Said piece 70 of rotation is the structure of rotating the torsion bar spring 6 on a fixed square as a fixed shaft. The support pipe 10 holds the torsion bar spring 6, and is supported by the horizontal tie rod 9 by the piece 11 of support.

[0017] The operation effectiveness of the chair (A) by this invention which has the above structures is described in a detail henceforth.

[0018] Since a chair will be maintained by the all seems well unless the force more than fixed is added for the back to also hang down if it applies to the back plate 3 of a chair (A), the back also hangs down and a user leans the back on 4, a user hangs on a chair (A) and can perform normal business (condition shown as a continuous line by drawing 1 and drawing 8). Such a condition is in the condition that a back-plate frame and the back also hang down, and the inside bases 21b and 22b of frames 21 and 22 touch tightly contact side 5b of the rotation limit fixed piece 5 (condition shown with a two-dot chain line by drawing 7).

[0019] In order that a user may take rest in such the condition, when the back is leaned on a back board 4 and it curves back, the back board frame 22 will carry out rotation movement a core [the point close to cutting section 22a] in back. Namely, since the back board frame 22 is cut by amputation stump section 22a and insertion immobilization of a part of rotation limit fixed piece 5 is carried out into amputation stump section 22a Although the contact side 5 which touched inside base 21b of the back-plate frame 21 of the rotation limit fixed piece 5 will separate from an inside base, the rotation limit fixed piece 5 will rotate clockwise and the torsion bar spring 6 therefore combined with the rotation limit fixed piece 5 will also rotate if the back board frame 22 rotates Since support immobilization of the pars intermedia 6a is carried out with the support pipe 7 as the torsion bar spring 6 is shown in drawing 2, torsional stress will occur as the both ends connected with the rotation limit fixed piece 5 of the torsion bar spring 6 after all rotate. Thus, since torsional stress occurs as the both ends of the torsion bar spring 6 are also rotated, while the rotation limit fixed piece 5 will rotate, if the back board frame 22 rotates, the stability which is going to return to the original condition will generate a torsion bar spring. Thus, if the rotation limit fixed piece 5 rotates and inclined plane 5a of the rotation limit fixed piece 5 touches inside top-face 21c of the back-plate frame 21, rotation movement of the rotation limit fixed piece 5 will be suspended, and, therefore, rotation movement of the back board frame 22 will be suspended.

[0020] In this case, since the tilt angle of the back board frame 22 becomes large, and the tilt angle of a back board frame becomes small when a tilt angle is small when the tilt angle (θ) of inclined plane 5a of the rotation limit fixed piece 5 is large, the inclination rotation angle of a back board frame can be adjusted by adjusting the tilt angle of the rotation limit fixed piece 5.

[0021] If the back also hangs down and a frame 22 curves back to a limit inclination rotation location, a user can take rest comfortably. The back board frame 22 which stability occurred in both-ends of distorted torsion bar spring 6 6b on the fixed square when the back board 4 on the back board frame 22 after a user takes rest appropriately to the back was detached, and it rotated counterclockwise, and the rotation limit fixed piece 5 therefore also rotated counterclockwise, and was fixed to this will also be rotated counterclockwise. In this case, if contact side 5b of the rotation limit fixed piece 5 rotates to the normal position which touches inside base 21b of the back-plate frame 21, rotation of the torsion bar spring 6, the rotation limit fixed piece 5, and the back board frame 22 will stop, and it will become usable in the normal position.

[0022] On the other hand, if the force is removed after the back board frame 22 curves on a fixed square back, as for a chair (C) equipped with the elastic restoration on-the-strength adjustment means (C) by this invention, the back board frame 22 will return to the original location according to

the stability of the torsion bar spring 6. As shown in drawing 9 , when an elastic restoration on-the-strength adjustment means (C) is in a continuous-line location, the repulsive force when the elastic stability of the torsion bar spring 6, i.e., the back, hanging down, and curving a frame back is in the condition which is min. When the stretching screw 8 with which the upper part touches the horizontal tie rod 9 is rotated, the piece 70 of rotation rotates counterclockwise centering on the torsion bar spring 6 by rotation of a stretching screw 8, and elastic repulsive force is made to increase in this condition. a stretching screw -- height (H') -- until -- if it rotates, the rotation angle of the piece 70 of rotation will serve as max, and the repulsive force when curving back in this condition, the elastic stability, i.e., the back board frame, of the torsion bar spring 6, will serve as max. That is, if the piece 70 of rotation rotates in the direction of an arrow head, the torsion bar spring 6 also rotates in the direction of an arrow head, and since the repulsive force of a torsion bar spring increases only in the part which rotated, the force which curves a back board frame back will become large. Thus, since the user of a chair can adjust the elastic stability of a back board frame to arbitration by adjusting a stretching screw by within the limits (H'), a chair can be used more comfortably.

[0023] Moreover, the elastic restoration on-the-strength adjustment means (C) of this example **** chair (A) Since the die length (L) of a number of the piece 70 of rotation is longer than height (H) and the height (H) of the piece 70 of rotation has the almost same structure as the rotation limit fixed piece 5 as shown in drawing 6 Since an elastic restoration on-the-strength adjustment means carries out at least 1cm or more isolation location from the back plate 3 of a chair even if it carries out laminating arrangement of the chair, as shown in drawing 10 , many chairs may be kept also in space narrow without damage on a back plate.

[0024]

[Effect of the Invention] As explained above, a chair equipped with the elastic movable means for back boards by this invention Since tilt of the back board frame can be carried out to a fixed angle with the elastic movable means for back boards which became by the rotation limit fixed piece and torsion bar spring of very easy structure in addition to the body frame As well as giving a user a comfortable feeling, a manufacturing cost is reduced, improvement of the productivity in large is carried out, and large extension of the use durable period of a chair is carried out. Moreover, since junction shaping of the elastic movable means is carried out by the plate of two or more sheets by which shearing was carried out and an elastic restoration on-the-strength accommodation means is installed rotatable considering the torsion bar spring of an elastic movable means as a core Manufacture of a rotation limit fixed piece is simple, the insertion fixed activity of a torsion bar spring becomes easy, a manufacturing cost is reduced, productivity improves, and since the elastic restoration reinforcement of a back board frame may be fluctuated to arbitration according to desire of a user, the expedient nature of use increases.

[Translation done.]

